DISEASE INFORMATION FACT SHEET

Feline leukemia virus

Disease facts

Feline leukemia virus (FeLV) is found worldwide in domestic cats, with variable sero-prevalence depending on geography and risk factors. Large serosurveys have found a prevalence of 2.3% in the United States in 2006 and 3.4% in Canada in 2009, with marked regional variation.

Viremic FeLV-infected cats shed virus in many body fluids, including saliva, feces, milk and urine. FeLV transmission occurs through sustained close contact among cats. Behaviors such as mutual grooming, sharing of food and water bowls and litter boxes, and fighting can contribute to transmission, primarily via saliva. Resistance to progressive infection increased with age in one study that evaluated two strains of FeLV in an experimental model. However, there are multiple strains of FeLV with different biological behaviors, and differences in immune responses among individual cats, and it is impossible to predict the dose of FeLV given during natural exposure. Thus, the degree of natural, age-associated resistance to FeLV cannot currently be predicted for individual cats.

In general, it is believed that kittens less than 16 weeks of age are most likely to develop progressive infection after exposure. However, adult cats may be susceptible to FeLV infection after long-term exposure.

Vertical transmission of FeLV occurs. Infected pregnant queens may suffer reproductive loss; kittens that survive to term are generally born viremic and fade quickly. Up to 20% of vertically infected kittens may survive to develop progressive infection as adults. Transmission to kittens may also occur via the milk from an infected queen or via saliva when the queen cleans the kittens.

Clinical research suggests that many cats may remain infected with FeLV for life following exposure, but may revert to a regressive state with a low risk of clinical disease. Following exposure, cats may exhibit mild clinical signs, such as fever and malaise, or may remain asymptomatic. For cats that remain persistently infected, this acute phase is followed by a period of asymptomatic infection that may last months or years. Ultimately, progressive infection occurs, with development of one of several FeLV-associated disorders (e.g., lymphoma, anemia) or a secondary
disease associated with immune dysfunction (eg, opportunistic infections, oral inflammatory disease).

FeLV is very labile outside of the host and remains infectious for mere minutes in the environment; in moist secretions it may survive until dried. It is readily inactivated by soap, disinfectants, heat and drying. FeLV is not zoonotic. In one study of 204 veterinarians and other occupationally exposed individuals, no serologic or molecular evidence of zoonosis with FeLV was detected. 9

**Vaccine types**

Several vaccines for FeLV are available, including whole inactivated virus, genetically engineered subunit or recombinant canarypox vector vaccines. The efficacy of commercially available vaccines is difficult to assess. 10 Most of the published efficacy trials have been conducted or supported by the vaccine manufacturer, and most studies do not evaluate more than one vaccine. Other factors hamper interpretation of vaccine efficacy, including lack of standard challenge and testing protocols as well as the difficulty of infecting adult cats without immune suppression. 3

Inactivated vaccines are most common. In addition, a recombinant FeLV vaccine has been shown to provide protection against persistent antigenemia equivalent to an efficacious inactivated vaccine. 11 One study using inactivated vaccines found that, after challenge, vaccinated cats had no detectable viral antigen, RNA, proviral DNA or infectious virus. 12 Other studies have shown that vaccines fail to prevent the persistence of proviral DNA following exposure. 13 Therefore, FeLV vaccination does not necessarily induce sterilizing immunity. Despite these findings, several current vaccines are efficacious at preventing virus persistence and replication, as well as FeLV-associated disease. 14

**Onset and duration of immunity**

Onset of immunity is 2–3 weeks after primary vaccination depending on the product. Minimal information concerning maximum duration of immunity for FeLV vaccines is available. Results of several studies indicate that FeLV vaccine-induced immunity persists for at least 12 months following vaccination. 15–17 In a recent 2 year challenge study, a greater proportion of glucocorticoid-treated control cats (11/11 cats; 100%) developed persistent FeLV viremia when compared with vaccinated cats (2/12 cats; 16.7%). 18 This study suggests that duration of immunity induced by some FeLV vaccines may last for at least 2 years.

**Vaccine safety**

Adverse events associated with vaccination against FeLV include local swelling or pain, transient lethargy or fever, and granuloma formation. (See the section in the Report on injection-site sarcoma formation, on pages 796–798, for a discussion of this potential side effect.)

**Other vaccine considerations**

Testing of cats prior to vaccination is essential to ensure negative status. Inadvertent use of FeLV vaccine in a cat infected with FeLV is not harmful, but it is also of no benefit. However, vaccination of a cat that is unknown to be retrovirus infected gives false expectations to the owner and could result in questions about vaccine efficacy and failure to recommend testing when the infection is finally discovered.

When a cat is vaccinated against FeLV for the first time, owners should be instructed to confine the cat until at least 2 weeks after the final vaccination to ensure that an adequate immune response has developed before risk of exposure.
References

11 Grosenbaugh DA, Leard T, Pardo MC, Motes-Kreimeyer L and Royston M. Comparison of the safety and efficacy of a recombinant feline leukemia virus (FeLV) vaccine delivered transdermally and an inactivated FeLV vaccine delivered subcutaneously. Vet Ther 2004; 5: 258–262.